ARTEMIS 2013 AIPP5
EMC²
A Platform Project on Embedded Microcontrollers in Applications of Mobility, Industry and the Internet of Things

Internet of Things and Multimedia Applications
Mixed-Criticality Cluster Workshop
Barcelona, November 22, 2016

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ABOUT QUOBIS

- Founded in 2006 as a VoIP system integrator.
- No VCs, privately held
- Addressing the software service provider market.
- HQ in Spain, worldwide sales through partners.
- Small size (~25 engineers).
ABOUT WebRTC

WebRTC... is an opensource project that makes possible to manage multimedia communications in the web browsers, using simples API's in Javascript, in a native way.

Opensystems, with no proprietary implementations

¡No plugins!

Multi-platform... and multi-device!
QUOBIS and WebRTC

We play a key-role in WebRTC industry, working on topics like standardization and dissemination in different groups and events:

- **Co-authoring different standards and drafts**, like the RFC7118 standard for SIP over Websockets, SIPoWS
- **Quobis** is co-chairing the SIP Forum **WebRTC Task Group**, whose objective is to enable of WebRTC for SIP-based domains
- **Quobis** is member of the ATIS DSI initiative, which is leading the **ORCA.js** API to be exposed by telcos
- **Authors of** **QoffeeSIP**, an opensource Javascript stack for WebRTC
QUOBIS proposal for WebRTC

- We’re focused on reducing the complexity of the deployment of WebRTC applications and clients by telcos and enterprises.
- Our solutions interops & complement the offering of leading vendors in the telecom space.

WEBRTC APPLICATIONS
Web collaboration, click to call, net Apps connectors, ad-hoc applications, etc.

WEBRTC APPLICATION CONTROLLED
Software based solution to abstract interconnection complexity, provide a complete set of API to develop applications fully interoperable with legacy architecture.
Sippo WebRTC Application Controller

Applications

40+ services: user mgmt, policy mgmt, CDR & stats, etc.

Sippo WAC

Service API

Sippo Connectors
AAA, user mgmt

Corporate IT

AD, LDAP
MS Exchange

Voice network

Call Recorder

ACD

PBX

SBC

WebRTC clients

WebRTC signalling

WebRTC media

Third-party WebRTC Gateway

Signalling

Media Relay

SIP

RTP / SRTP

SIP Providers
The role of Sippo WebRTC Application Controller

The WAC enables the integration of browser-based real-time services with existing IMS/NGN or UC networks.

1. Hides complexity of different implementations of WebRTC by browsers, including those that need a plugin to support WebRTC. Provides hybrid applications for smartphones like Android and iOS.

2. Manages different signaling protocols (SIPoWS, JSON, proprietary APIs, etc) to being able to use any industry WebRTC gateway.

3. As a host of WebRTC applications, provides security mechanisms to avoid traditional VoIP attacks and pure web and WebRTC threads.
The role of Sippo WebRTC Application Controller

WebRTC applications are developed on top of a orca.js compatible API called **sippo.js**, available for 3rd parties that want to create applications.

Manages **interconnection with existing systems** for user management (authentication, privileges, accounting, policies, etc) via a **Service API** and different **Sippo connectors** with well-known solutions like LDAP, MS Exchange, leading HSS, etc.

Makes **multi-tenancy** a reality, exposing different applications to corporate or residential customers of service providers. Includes **statistics**, easy to adopt **management tools and customization functionalities**,
Internet of Things & IT infrastructure
Motivation in EMC2

Living Lab Internet of Things

• Multimedia communications
• Open deterministic networks
• Autonomic home networking
• Ultralowpower high datarate communication
• Synchronized low-latency deterministic Networks
Internet of Things & IT infrastructure
Multimedia communication

- Address large-scale application of UC Services web-based on Embedded Systems.
- Main goal is to enable audio or video communication, images, files and data transfer through web-based applications on any type of small embedded systems, to have the possibility to adapt these systems to the new paradigm where the web browser is going to be the player.
- **Multimedia processes** distribution over multicore CPUs
MINIX NEO X7 Mini

- Released in September 2013.
- This element is part of the family of Android TVs (linked with elements like HDMI dongles, AppleTV or ChromeCasts).
- It runs an Android 4.2.2
- HDMI interface with 1080p HD video.
- Supports mouse, keyboard, camera and microphone.
- Video processing capacities to deal with video contents over WebRTC.

MINIX MEO X7 Mini features

<table>
<thead>
<tr>
<th>Processor</th>
<th>Quad-Core Cortex A9 Processor</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPU</td>
<td>Quad-Core Mali 400</td>
</tr>
<tr>
<td>Memory</td>
<td>2GB DDR3</td>
</tr>
<tr>
<td>Internal Storage</td>
<td>8GB NAND Flash</td>
</tr>
<tr>
<td>Wireless Connectivity</td>
<td>802.11n Wi-Fi, Bluetooth 4.0</td>
</tr>
<tr>
<td>OS</td>
<td>Android™ Jelly Bean 4.2.2</td>
</tr>
</tbody>
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Use case architecture

- The WAC solves part of the complexity of a real field implementation.
- The WAC hides the complexity of the existing fragmentation of devices, browsers and interconnection.
- Media processing is separated in parallel sources -> Web Workers
Web workers

• Defined by the World Wide Web Consortium (W3C) and the Web Hypertext Application Technology Working Group (WHATWG).

• **Web Workers** are scripts that are not interrupted by user-interface scripts (scripts that respond to user interactions).

• Web workers are able to utilize **multi-core CPUs** more effectively in the multimedia domain.

• Keeping such workers from being interrupted by user activities allow our use case to remain responsive to audio and video from users at the same time as it is running **critically data tasks**.

• The W3C and the WHATWG are currently in the process of developing a definition for an API for web workers.
A real application: eHEALTH

- Communications between hospitals, emergency vehicles and patient portals at home.
- Interoperable collection of information from devices
- Wireless 3G/4G communication
- Sources: audio-video data, point-of-care device data and patient medical history data.
Many thanks!

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